

REMARKS

Reconsideration of the instant application is respectfully requested. The present amendment is responsive to the Office Action of November 6, 2003, in which claims 1-31 are presently pending. Of those, claims 1-5, 7-11, 13-17, 19-23, 25, 26 and 28-30 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 6,043,658 to Leussler. In addition, claims 6, 12, 18, 24 and 31 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Leussler, in view of U.S. Patent 6,522,140 to Harvey. Finally, claim 27 is rejected under 35 U.S.C. §103(a) as being unpatentable over Leussler, in view of U.S. Patent 5,114,240 to Mehdizadeh, et al. For the following reasons, however, it is respectfully submitted that the application is now in condition for allowance.

Independent claims 1 and 13 have been amended to more particularly point out the fact that the output receiving circuitry is further configured to independently read each of the plurality of resonance modes with respect to one another. It is further pointed out that this claimed feature is already included in independent claims 7, 19 and 25.

On page 2, paragraph 2 of the present Office Action, the Examiner takes the position that Leussler discloses a degenerate birdcage coil having "...output receiving circuitry receiving said emitted RF energy at a plurality of resonance modes at a single frequency of said degenerate birdcage coil, including said first resonance mode (Column 4, lines 61-67)." Although Leussler generally acknowledges in Column 4 and Figure 3 of the '658 patent that the coil has a number of resonance modes or resonance frequencies that amounts to half the number of conductors present (i.e., $N/2$ resonance modes), there is no teaching or suggestion therein of configuring receiving circuitry that is capable of independently reading each of the resonance modes at the same frequency.

More specifically, the processing channels 9 shown in Figures 1, 4 and 5 of Leussler are not configured to independently read each resonance mode at a single

frequency. Regardless of whether one processing channel is used for each rung (as shown in Figures 1 and 4), or whether a combination circuit is used to reduce the number of processing channels in half (as shown in Figure 5), the processing channels will still receive signals corresponding to each of the resonance modes. All Leussler discloses is that the birdcage can be configured with band-pass type capacitances such that neither high-pass nor low-pass behavior occurs and where all resonance modes occur at the same frequency. Thus, for example, using an 8-rung birdcage resonator, the receiving circuitry of Leussler would receive each the four resonance modes associated with a single frequency, but without a means for separating the same from one another (i.e., without a way of independently reading the resonance modes).

In a telephone interview between the Examiner and the undersigned on May 18, 2004, it was pointed out on behalf of the Applicants that (in contrast to the teachings of Leussler), the presently claimed invention provides receiver circuitry for accomplishing independent reading of each of a plurality of resonance modes of RF energy at a single frequency. For example, the circuitry of Figure 3 is configured to independently receive the homogenous first mode of the 8-rung degenerate birdcage (specification paragraph 0035); the circuitry of Figure 4 is configured to independently receive the second resonance mode (specification paragraph 0036); the circuitry of Figure 5 is configured to independently receive the third resonance mode (specification paragraph 0037); and the circuitry of Figure 6 is configured to independently receive the fourth resonance mode (specification paragraph 0038).

Accordingly, since Leussler does not teach each and every element of independent claims 1 and 13 as now amended, as well as claims 7, 19 and 25 as previously presented (and the claims dependent therefrom), there is no anticipation of the claims by Leussler. Moreover, it would not be obvious to one skilled in the art to modify the teachings of Leussler to include additional receiving circuitry for independent reading of the higher order modes, since Leussler actually teaches providing fewer receiving circuit elements. For example, in column 5, lines 30-36 of Leussler, it is stated that:


"It is a drawback of this processing principle that eight processing channels are required (when the MR coil comprises eight meshes or eight conductors 80.) An MR apparatus comprising fewer processing channels, therefore cannot process the MR signals in this manner. Therefore, FIG. 5 shows a solution which requires only half the number of channels."

Accordingly, it is respectfully submitted that both the §102 and §103 rejections have been overcome, and that the present application is now in condition for allowance. No new matter has been entered and no additional fees are believed to be required. However, if any fees are due with respect to this Amendment, please charge them to Deposit Account No. 07-0845 maintained by Applicants' attorneys.

Respectfully submitted,
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